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Non-communicable diseases and the Social Determinants of Health in the Nordic countries: findings from the European social survey (2014) special module on the social determinants of health

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Introduction

Non-communicable diseases (NCDs) have been responsible over the past few decades for the majority of the health burden in Europe and worldwide[1]. Ill health inherently limits opportunities for individuals to transform their functional capabilities into social and economic activity. Among a long list of NCDs, cardiovascular disease and cancer have become the most common causes of premature death and the main cause of disability in the European region[2]. Other NCDs, like diabetes, depression and musculoskeletal conditions have also taken a toll on workforce participation and labour productivity, and more generally have undermined quality of life – particularly in later life[3]. NCDs have a slow progression and their causes are multiple but in large part, the leading risk factors for NCDs are socially stratified and resonate with the socio-economic conditions of the individual and their country context[4, 5].

Several social determinants have been associated with suboptimal health in the population including risky health behaviours (e.g. smoking, alcohol consumption, and lack of physical activity), life course events (e.g. divorce, homelessness, financial problems), material resources (e.g. access to jobs, health care, schools, transport, social care), physical working conditions (e.g. ergonomic or chemical hazards), psychosocial resources and stress-related factors (such as control at work or social support)[6-9]. Or put more simply, social conditions in which people live and work[10]

The Nordic countries (Denmark, Finland, Norway and Sweden) are considered very similar in terms of their social structure and culture. Moreover, their longstanding commitment to egalitarian welfare policies has often made the Nordic countries a benchmark in comparative social and health inequality studies[11, 12]. Their welfare state generosity strives to tackle precisely these living and working conditions that are conducive to poor health. These policies have achieved remarkable improvement in overall health and mortality rates over the last few decades across all social groups, resulting in some of the highest average life expectancies for all social groups. However, from this remarkable improvement not all social groups have benefited equally. , Earlier research has argued that the absence of smaller health inequalities in Nordic countries against a background of healthier societies due to the generosity of welfare states has led to a public health puzzle in comparative health inequalities research[13]. The Nordic paradox has given rise to extensive research documenting socioeconomic inequalities for various health outcomes[14-16] and possible explanations[17].

In light of several challenges that European countries face, such as ageing populations, rapid changes in living conditions and more ethnically mixed societies, a better understanding of the prevalence of NCDs, and of behavioural and social determinants of health is paramount to sustaining informed public health decision making. Comparable data on health determinants and outcomes are scarce and studies have tended to focus more on general health measures[18]. Indeed, with the exception of a small scale survey in 1972 of NCDs in Nordic countries, there has been little by way of comparative research[13]. This study builds and expands upon previous literature by comparing between-region differences in NCD prevalence in order to determine which self-reported conditions are producing a greater health burden in the Nordic region in comparison to

other European regions. Next, differences between and within Nordic countries are identified with the intention of providing a fine-grained overview of the specific challenges faced by the overall population, and by people of different genders. We also include an examination of regional, country, and gender differences for large numbers of material, behavioural, occupational and psychosocial risk factors as suggested in the literature[19]. This paper therefore provides the first comprehensive overview of NCDs, and the behavioural and social determinants of health for the Nordic countries. It also suggests some initial hypotheses/ideas for future research that can contribute to improving our understanding of how and why health varies between the Nordic countries and other regions.

Data and methods

The new special module on social inequalities in health and their determinants from the seventh wave of the European Social Survey (ESS) (2014) (for a full overview of the ESS survey including data collection see Eikemo et al. 2016) offers the opportunity for a comprehensive comparison of a large number of European countries on 17 health outcomes, including 13 NCDs (heart/circulatory problems, high blood pressure, back pain, arm/hand pain, foot/leg pain, allergies, breathing problems, stomach/digestion problems, skin conditions, diabetes, severe headaches, cancer and depression), and on an extensive set of material, behavioural, occupational and psychosocial determinants of health. This round of the survey contains information on individuals from 20 European countries plus Israel grouped in four regions: Nordic (Norway, Sweden, Finland and Denmark), West (Austria, Belgium, France, Germany, Netherlands, Switzerland, Ireland and the UK), Central/East (Czech Republic, Hungary, Poland, Slovenia, Estonia and Lithuania) and South (Spain, Portugal and Israel). The Nordic countries are the focus

of our analysis and estimates from pooled European and region-specific analysis are used to place the Nordic countries in a comparative context.

The data reported in this study on the prevalence of health outcomes and on their behavioural and social determinants were obtained using the complete sample of the European Social Survey without any age restrictions and following the categorizations presented in two earlier prevalence studies by Huijts et al.[20, 21]. We present separate results for men and women. All estimates were age-standardized by weighting up or down the unstandardized (crude) prevalence rates for five-year age groups in each country to a common standard. We weighted the age groups following the European Standard Population (ESP) of 2013.

Results

Health in the Nordic Countries

Two groups of NCDs can be roughly distinguished. The first group of NCDs consists of heart or circulation problems, diabetes, cancer, high blood pressure, breathing problems, severe headaches, allergies, skin and stomach problems and depressive symptoms, with a self-reported prevalence ranging from less than 5% to up to 20% of the sample. With the exception of diabetes, these NCDs are more prevalent among women.

Across these NCDs and for both genders, the Nordic region showed among the lowest prevalence for heart or circulation problems (8–9%), severe headaches (7–17%), sereous depressive symptoms (7–12%), (current) cancer (2–3%) and, for women only, diabetes (5%) (See supplementary file 1). Nonetheless, figure 1 shows that differences are observed within the

Nordic region. Heart/circulation problems, severe headaches and diabetes tend to be more pronounced for both genders in Finland. Finland and Norway have among the lowest prevalence of severe depressive symptoms in our study. In addition, Norway outperforms most other countries with respect to current cancer levels, which are especially low for women (<1%).

------Figure 1.-----

Compared to other regions, women in the Nordic region reported higher levels of breathing (12%) and stomach problems (24%) while high blood pressure (18%) was more prevalent among Nordic men. Overall, breathing problems were more common in Norway and Finland while higher percentages of stomach problems were observed in Sweden and Finland. For high blood pressure, again Finland demonstrated the highest prevalence while Norway showed not only the lowest prevalence (15%) among Nordic countries but also the second lowest in the entire sample.

Allergies and skin problems were more common in the Nordic region for both genders and more pronounced among women. Skin problems were particularly prevalent in Finland while Norway reported the highest level of allergies in the overall survey.

The second group of NCDs consists of back pain, hand/arm pain and foot/leg pain, which were more common among women and were the most prevalent NCDs (21-52%) in our sample. Compared to other regions, Nordic women experienced higher rates of back pain, while the other conditions were all more prevalent among Nordic men. Between-country comparisons showed that foot/leg and back pain were more prevalent in Finland. Hand/arm pain displayed a consistent pattern across the Nordic countries.

The rate of experiencing only one of the NCDs were similar across West, Nordic and Southern regions of Europe. However in the Nordic region, a higher proportion of respondents had multimorbidity and were hampered at least to some extent by a longstanding illness. Nonetheless, levels of overall health were found to be better in the Nordic region with only 4% of men and 7% of women reporting poor or very poor health. Looking at variations between Nordic countries, Finland registered a lower level of experiencing only one of the NCDs but at the same time the highest levels of multimorbidity. However, comparable percentages of respondents from these countries reported being in poor/very poor health (with the exception of Norwegian women) and being hampered by longstanding illness

In terms of within-country gender inequalities, Norway emerged as the Nordic country with the largest gender difference for several health outcomes including self-rated health (SRH), breathing, allergy, back pain, arm pain, leg pain and multimorbidity. Sweden showed substantial gender variation for limiting long-standing illness and stomach problems, while Finland did so only for skin problems.

The Behavioural and Social Determinants of Health in the Nordic Countries

Causes and inequalities of NCDs do not stem merely from the genetic/metabolic composition of individuals but derive in large part from risk factors related to behavioural, occupational and living conditions. We refer to these risk factors as the behavioural and social determinants of health. In the Nordic region (supplementary file 2), with respect to behavioural determinants we observed for both genders the lowest current smoking levels (19–22%) together with lowest number of respondents consuming 20 or more cigarettes per day (16–25%), highest levels of

physical activity on at least 3 days (25–26%) and especially for women the highest daily consumption of fruit and vegetables (54–72%).

-----fig. 2 -----

Alcohol consumption was measured in terms of frequency, quantity and harmful use (binge drinking) of alcohol. The Nordic population was found to consume among the largest number of alcohol units based on the last occasion of drinking on weekdays (2.8–4.3 units) and weekends (5.8–9.1 units) while the frequency of alcohol consumption was among the lowest in the European region. On the other hand, the Nordic region reported the lowest binge drinking levels (0.8–2.1%). Despite a favourable position in terms of behavioural determinants, the Nordic population performs only slightly better than other regions in terms of obesity levels.

As concerns variation between the Nordic countries, similar patterns were found for physical activity rates, fruit and vegetable consumption and units of alcohol consumed during the weekend. Sweden outperformed the other Nordic countries for smoking behaviour with the lowest proportion of respondents being current smokers and smoking 20 or more cigarettes per day. In Denmark, there was more frequent alcohol consumption and larger amounts of alcohol consumed on weekdays. Obesity levels were higher in Finland.

Out of the three occupational determinants in our study, exposure to material (48–68%) and ergonomic hazards (64–71%) during a previous or current job, was more prominent in the Nordic region compared to the rest of Europe. On the other hand, the Nordic population exercised considerably greater control over their jobs (6/10). Finland stood out with the largest

share of respondents having been exposed to any ergonomic or material hazard at work, while job control was slightly greater in Sweden and Norway.

For living conditions, we examined variation in health care utilization, provision of unpaid care, housing quality and childhood conditions. At the regional level, the Nordic population reported the lowest level of unmet need (10–14%) and among the lowest levels of GP (66–75%) and especially specialist (30–37%) care utilization. For alternative treatments, the opposite trend was observed. Among Nordic countries, the highest level of unmet need for both genders was encountered in Finland despite the Finnish population reporting a higher overall utilization of health care services and alternative treatments. Sweden and Norway reported less utilization of GP and specialist care respectively. The Nordic region had the highest percentage of respondents providing unpaid care (39–43%); however, the proportion of people providing 10 hours or more of unpaid care per week was the lowest (10–15%). The percentage of respondents providing unpaid care was similarly distributed among Nordic countries but more intensive care provision was reported in Denmark and by Swedish women.

In general, the Nordic population showed a low level of housing problems (11–13%) with the exception of Danish women. For childhood conditions, conflict in the household while growing up was more common in Nordic (9–16%) and Western European (12–17%) populations. Nonetheless, in our study, respondents from the Nordic region had experienced the lowest level of financial hardship while growing up (11–14%). Within Nordic countries, experience of financial hardship during childhood was more prevalent in Finland, while conflicts in the household were more prevalent in Denmark.

Across all regions, women are more likely than men to report a higher prevalence of determinants related to living conditions such as utilization of GP and specialist care, alternative treatments, provision of unpaid care, experiencing financial hardships and household conflicts while growing up, and housing problems. Concerning determinants related to working conditions, men in all regions reported greater exposure to material and ergonomic hazards than women, but also perceived a higher level of control over their jobs than women. Among behavioural determinants of health, both genders reported similar levels of physical activity. Smoking and alcohol consumption were more prevalent in men, and fruit and vegetable consumption more prevalent in women. Gender differences varied considerably across Nordic countries, especially for living conditions.

Discussion

This is the first study to present a comprehensive overview of the distribution of social and behavioural determinants of health and of physical and mental NCDs in the Nordic population, including an examination of differences by gender. Our analysis at the regional level has elucidated the relative health position of the Nordic region in comparison to other European regions. Compared to other regions, heart/circulation problems, cancer, depressive symptoms and diabetes – identified as being among the major NCDs responsible for most of the burden of disease in the European region[22, 23] – were less prevalent in the Nordic countries. Unhealthy lifestyle and poor access to health care are considered to be leading causes of major NCDs[24]. Our findings suggest that healthier lifestyles and lower levels of unmet need observed in Nordic

countries might be responsible for low prevalence rates of major NCDs. Future research examining the casual role of health care and public health policies in the adoption of these behaviours would contribute to disentangling the effects of institutions from cultural determinants of health.

Overall in our study, the population of the Nordic region reported among the highest prevalence for one or both genders in 10 out of 17 health outcomes including breathing problems, high blood pressure, skin problems, allergies, stomach problems, back pain, arm/hand pain, leg/foot pain, multimorbidity and being hampered by a longstanding illness. This poor performance of the Nordic countries reveals that overall population health outcomes are not better than in other European countries challenging thus the premise of the Nordic paradox. Nevertheless, it is worth noting that this premise is based largely on overall levels of health (SRH) and mortality studies[6]. Indeed our data also confirm that despite being the region with the highest prevalence of most health outcomes, overall self-rated health levels (SRH) tend to be better in the Nordic region. Earlier studies on NCDs have shown that even though absence of NCDs is important to the formation of subjective health perceptions, people with NCDs can also report good health[25]. This seems to be especially the case in the Nordic countries. It is therefore important to expand our understanding of the Nordic paradox premise. Which NCDs are more likely to change individual perception of health? Are these conditions less prevalent in the Nordic countries or are Nordic populations more likely to rate their health better because they are imbedded in a more generous welfare state? A promising research approach focusing on the nature of NCDs could disentangle the association between general health and NCDs in the Nordic region. Our understanding of how NCDs influence overall health and quality of life would likely benefit from future research

investigating the multifaceted and dynamic process by which experiences with specific NCDs or combinations thereof are translated into self-reported health.

Most of the NCDs studied were reported by at least a quarter of the population in the Nordic countries and in some instances affected more than half of all respondents. Poor health conditions mean that a substantial proportion of the population in the Nordic countries might be unable to benefit from the general progress of society. However, our findings have shown that NCDs are not evenly distributed among countries. Similar to earlier studies[26-28] our results confirmed that Finnish respondents continue to reported higher prevalence compared to other Nordic countries for most NCDs. In line with previous research, this suggests that the relatively poorer socioeconomic conditions in Finland in the first decades after the Second World War may have had a long-lasting impact on people's health throughout the life course. The slow progression of NCDs reflects past and cumulative social and behavioural determinants of health, and the future health burden in Finland will likewise be determined by population exposure to current determinants. The main difference between Finland and the rest of the Nordic countries was demonstrated for occupational determinants and health care access. Future comparative research could usefully employ an institutional approach[29] to assess how particular aspects of the Finish occupational and health care policy may have contributed to persistently lower levels of health distribution.

As in previous studies[30], gender differences for NCDs in the Nordic countries follow the same pattern as in the rest of Europe, with NCDs more prevalent among women, except for diabetes. Although men in all Nordic countries report higher levels of morbidity, women suffer from multiple NCDs, have their health hampered by a longstanding illness and report poorer health

more often than men. Our findings suggest as a starting point for further investigation the disadvantages in health determinants related to living conditions that accrue to women in all Nordic countries. The gender dimension of NCDs requires in-depth studies of the influence of gender on the underlying causes and consequences of NCDs. This research agenda is especially relevant for Norwegian public health policies, which need to account for an even greater gender difference than in other European countries (for several NCDs).

The ESS health module has the potential to contribute to European public health discourse with a research agenda that goes beyond the traditional investigation of NCDs as causes of death and which considers them more as long-lasting health experiences that are likely to alter and limit the social and economic opportunities of individuals. Among the social determinants of health, mainly behavioural determinants have previously been investigated in relation to overall measures of health[31], specific NCDs[32] and health inequalities[33]. In this respect, the ESS health module provides an extraordinary opportunity to unpack the contribution to health and health inequalities of working and living conditions for a large set of health outcomes.

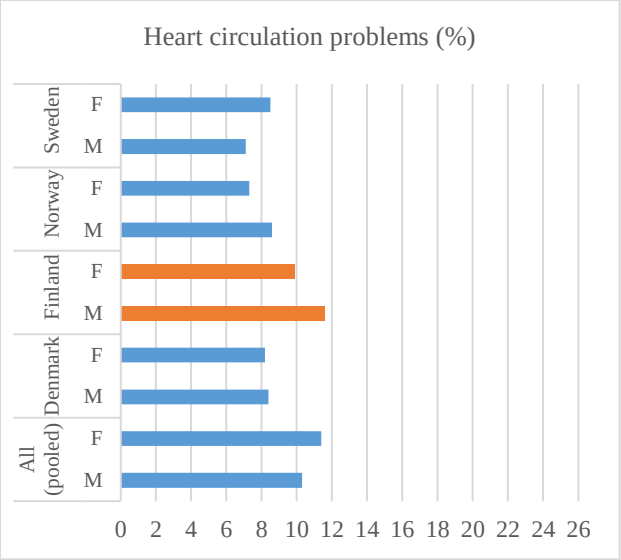
Limitations

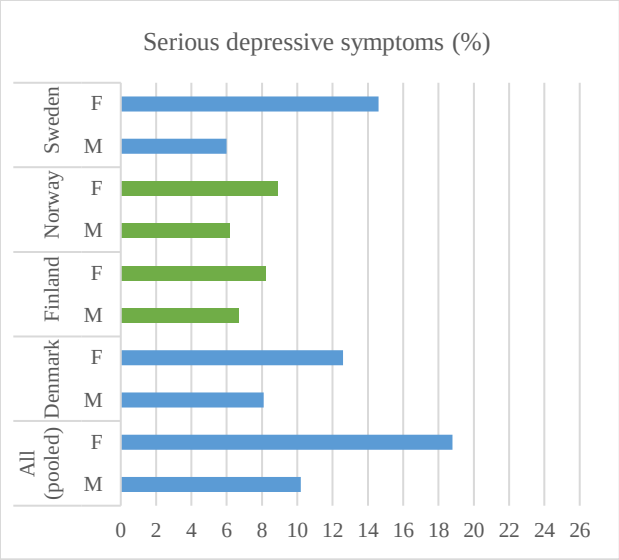
There are some limitations to this study that deserve to be highlighted. Firstly, all measures used are self-reports, and may therefore be subject to reporting bias. Our measures do not reflect a medical diagnosis of NCDs or other more general health outcomes. However, this also has the advantage of capturing health problems that would not have been reported if the focus would have been solely on diagnosed conditions. This is especially important in light of substantial

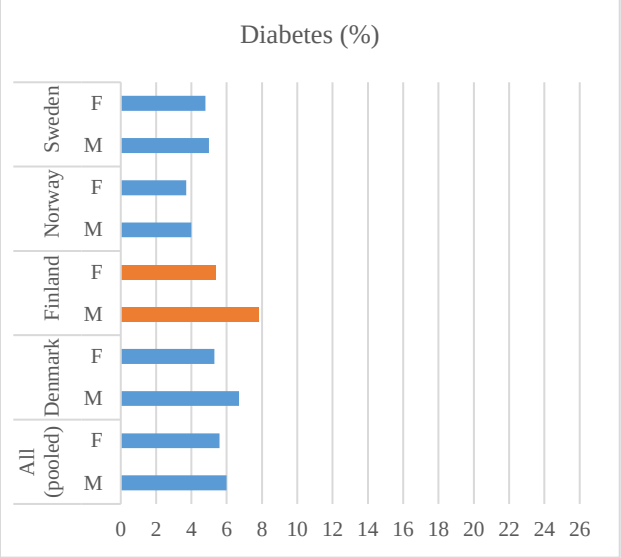
numbers of people who report unmet need for healthcare, even in this selection of Nordic countries where access to healthcare is generally universal and affordable.

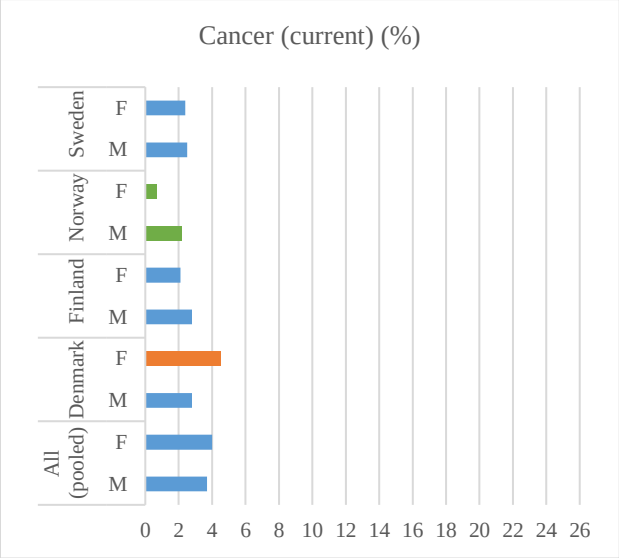
Secondly, we used survey data for our analysis, which means that we may not have captured the whole population, and our data are likely to not be fully representative of the populations in the four Nordic countries. For example, as with other surveys, the ESS suffers from non-response, which may be selective among dimensions such as income, age and education. Furthermore, the survey only covers the non-institutionalized population, which means that e.g. people in very old age and people who are hospitalized due to serious health problems are likely to be underrepresented. As such, we assume that the health problems in this study are likely to be underestimated. All in all, therefore, especially compared to studies based on full population register data in the Nordic countries, we need to be careful in interpreting our findings in terms of population prevalences of NCDs and more general health outcomes.

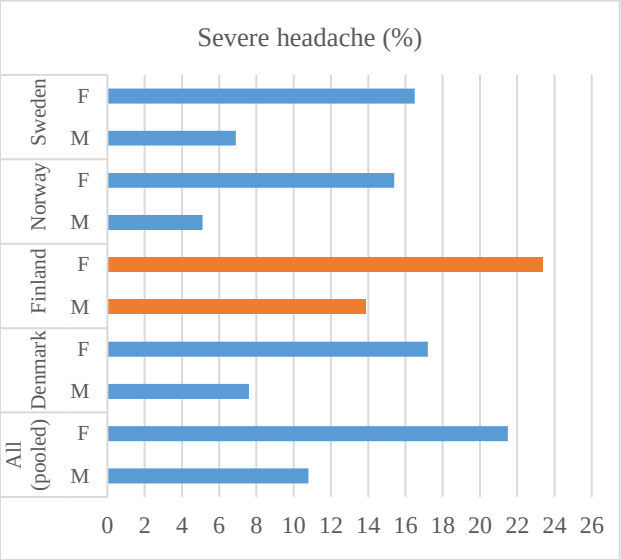
Thirdly, although the ESS offers a unique opportunity by providing comparable data on a range of health outcomes for Denmark, Finland, Norway and Sweden, unfortunately it does not include any respondents from Iceland. Especially in light of the recent financial crisis and reports on its impact on the Icelandic population it would have been valuable to compare this broad range of health outcomes between Iceland and the other Nordic countries.


Heart circulation problems (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12 14 16 18 20 22 24 26


Serious depressive symptoms (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12 14 16 18 20 22 24 26


Diabetes (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12 14 16 18 20 22 24 26


Cancer (current) (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12 14 16 18 20 22 24 26


Severe headache (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
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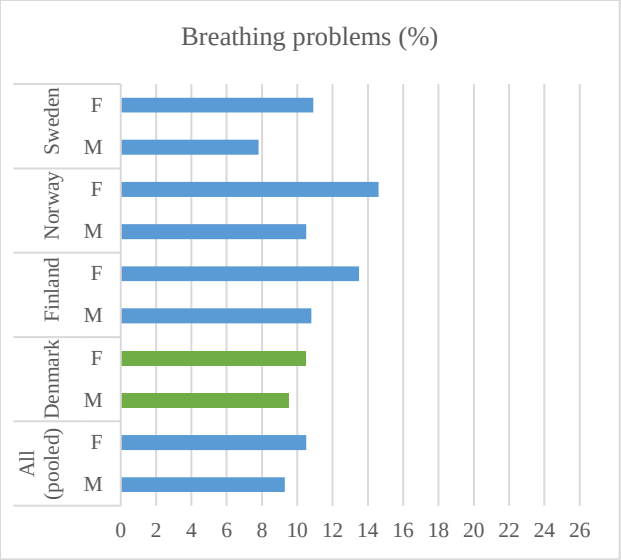
Breathing problems (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
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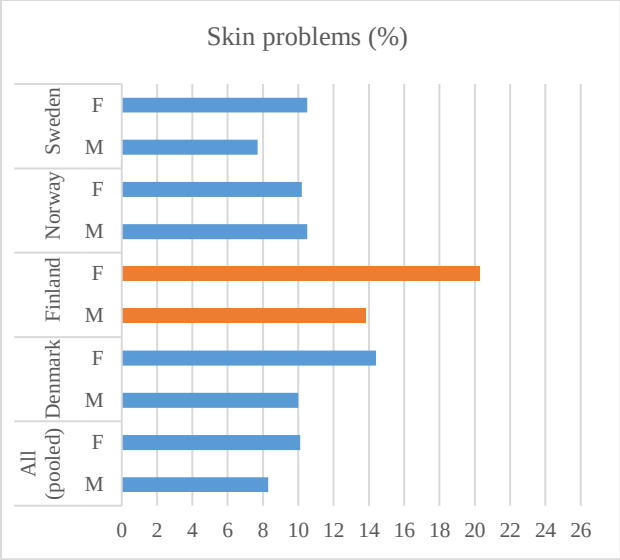
Skin problems (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
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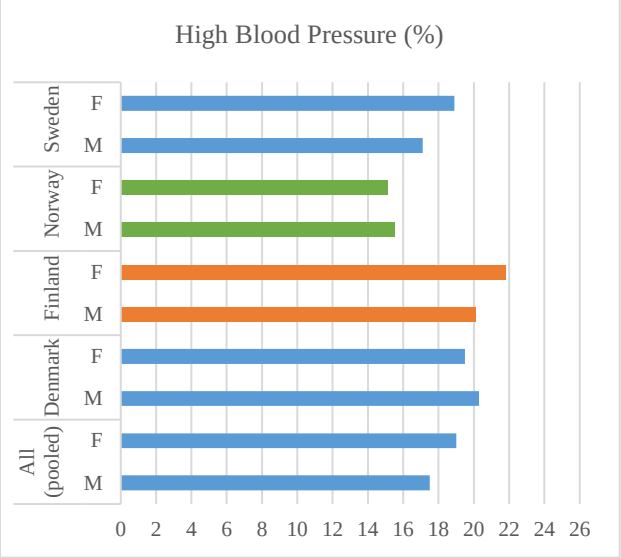
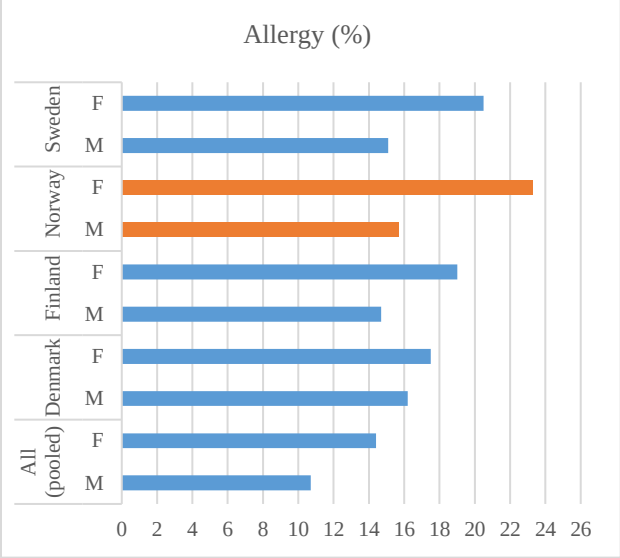
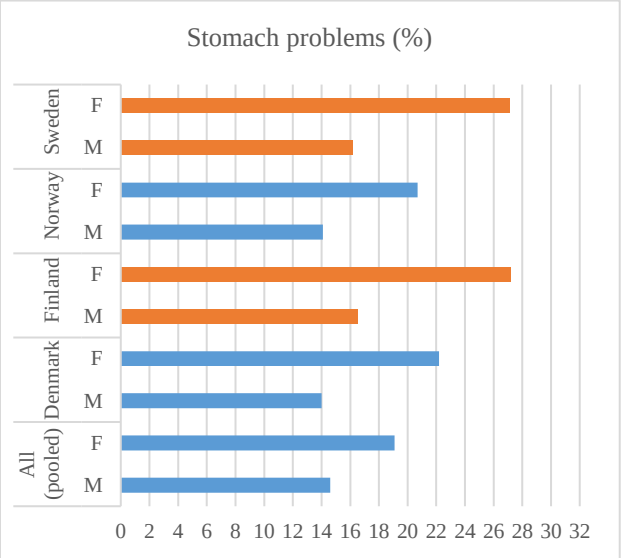
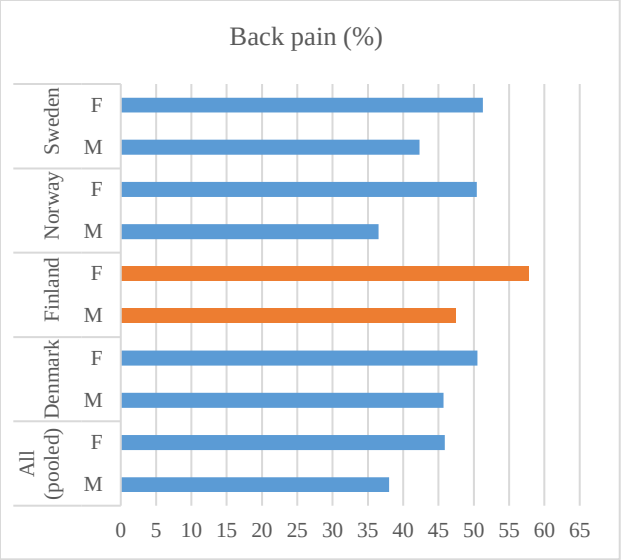
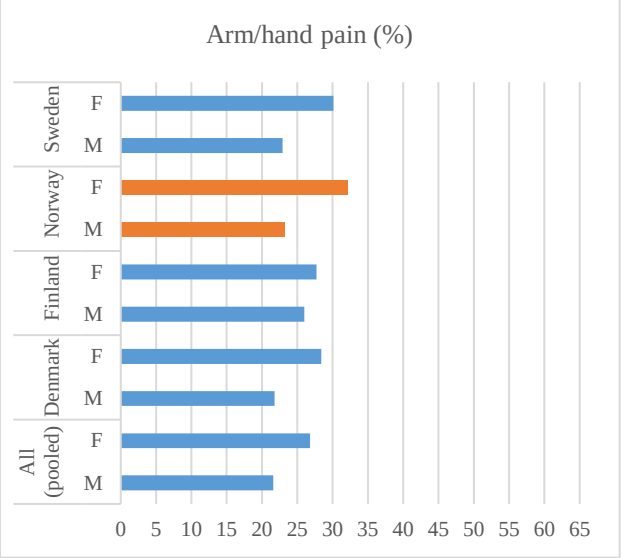
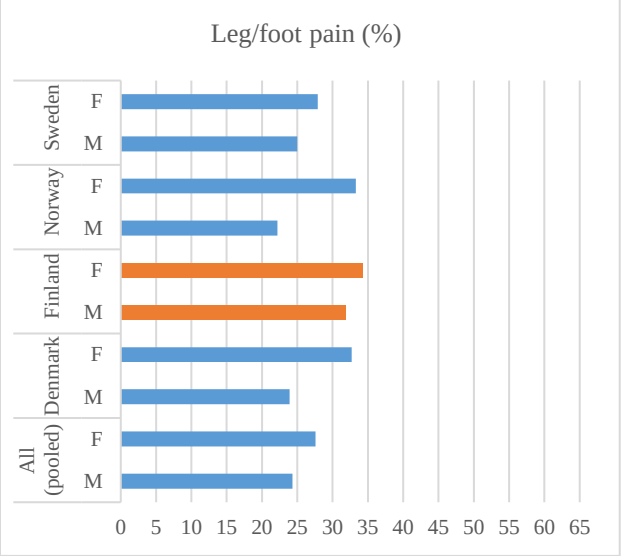

High Blood Pressure (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12 14 16 18 20 22 24 26


Allergy (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12 14 16 18 20 22 24 26


Stomach problems (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32


Back pain (%)
Sweden
F
M
Norway
F
M
Finland
F
M
Denmark
F
M
All (pooled)
F
M
0 5 10 15 20 25 30 35 40 45 50 55 60 65


Arm/hand pain (%)
Sweden
F
M
Norway
F
M
Finland
F
M
Denmark
F
M
All (pooled)
F
M
0 5 10 15 20 25 30 35 40 45 50 55 60 65


Leg/foot pain (%)
Sweden
F
M
Norway
F
M
Finland
F
M
Denmark
F
M
All (pooled)
F
M
0 5 10 15 20 25 30 35 40 45 50 55 60 65

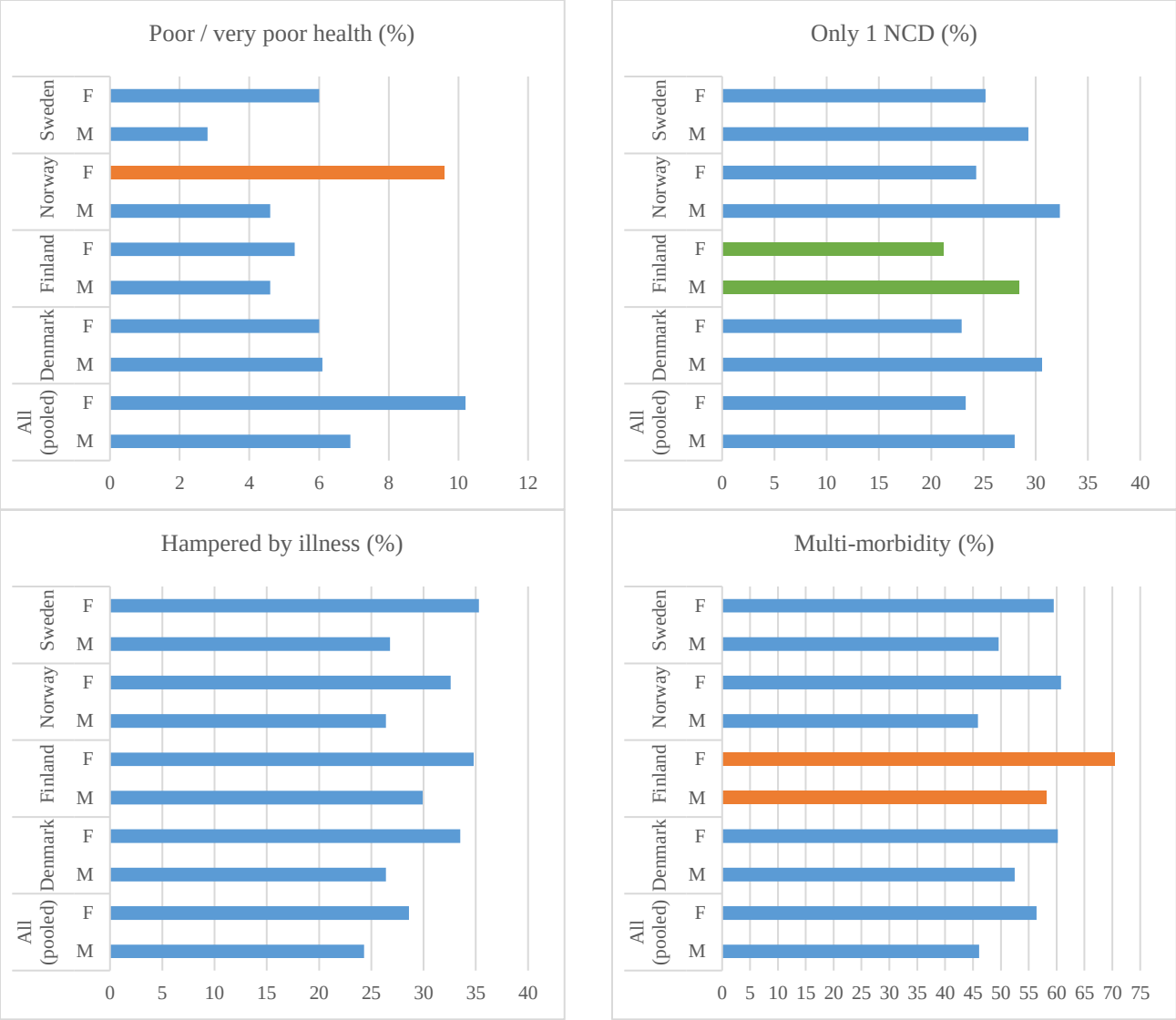
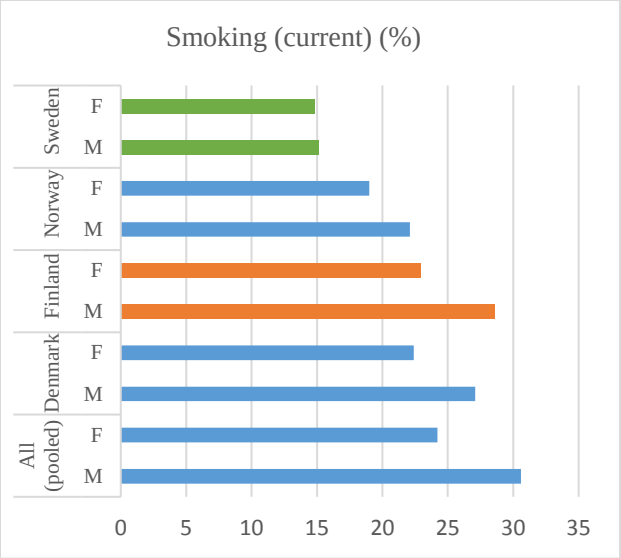
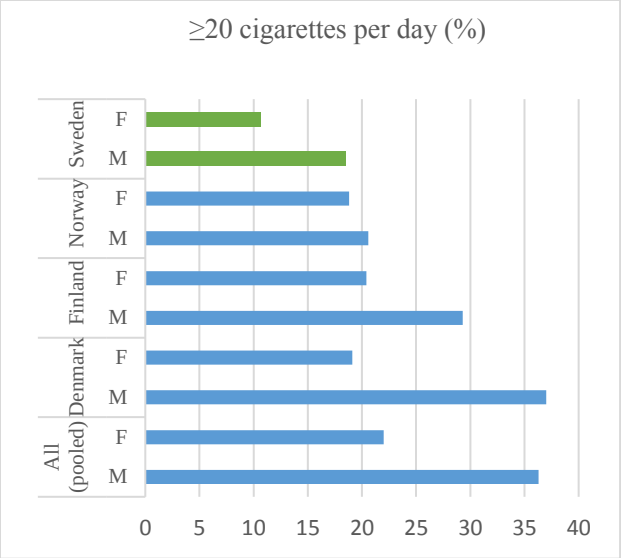
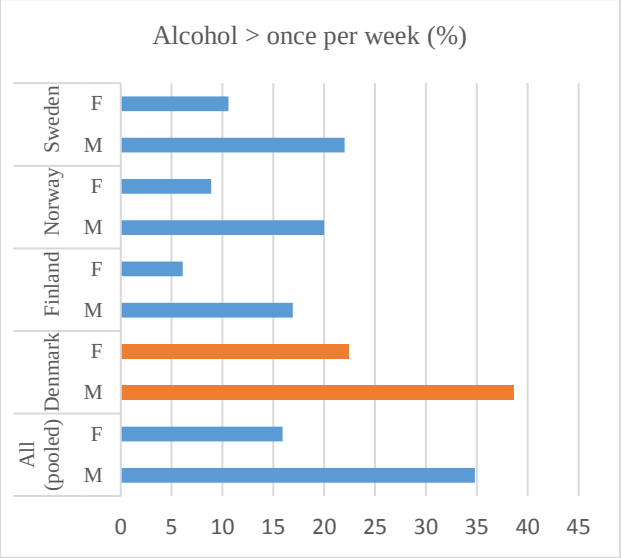
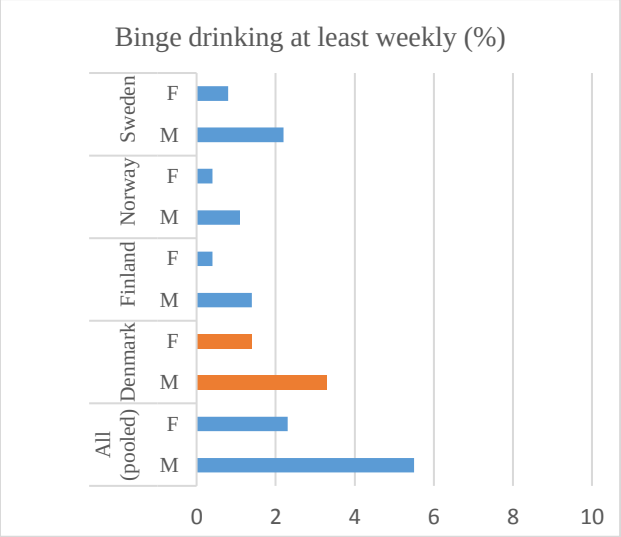


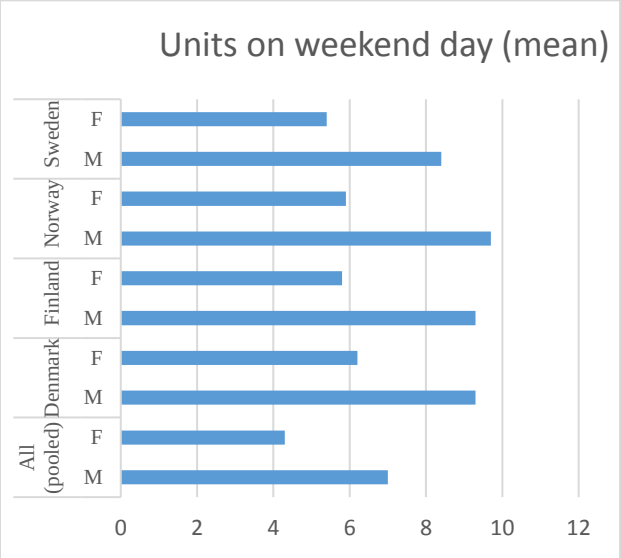
Figure 1. Self-reported non-communicable diseases and general health outcomes for Nordic countries and the European pooled sample (separately for men and women). The X-axis shows the percentage of individuals in each population that report a given NCDs. Green bar=lowest prevalence; Orange bar=highest prevalence

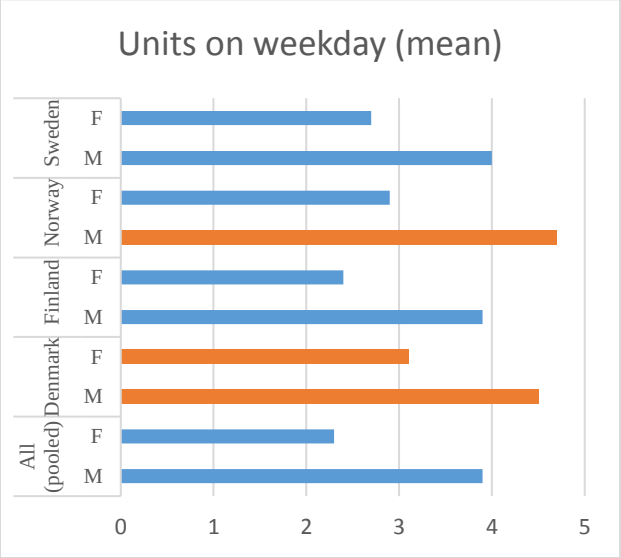

Smoking (current) (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 5 10 15 20 25 30 35

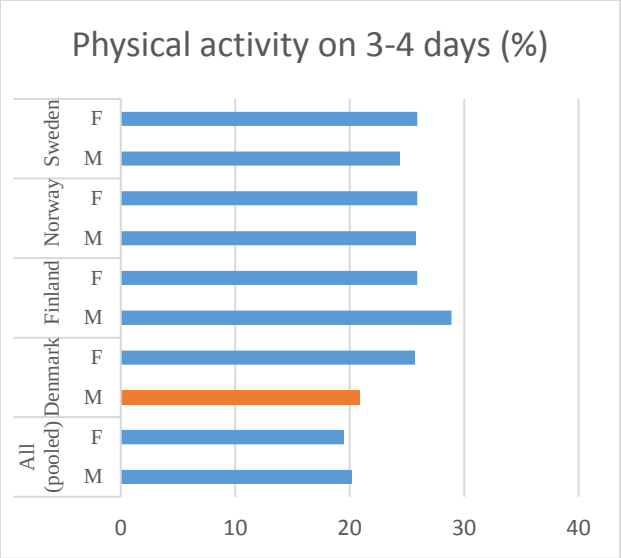

≥20 cigarettes per day (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 5 10 15 20 25 30 35 40

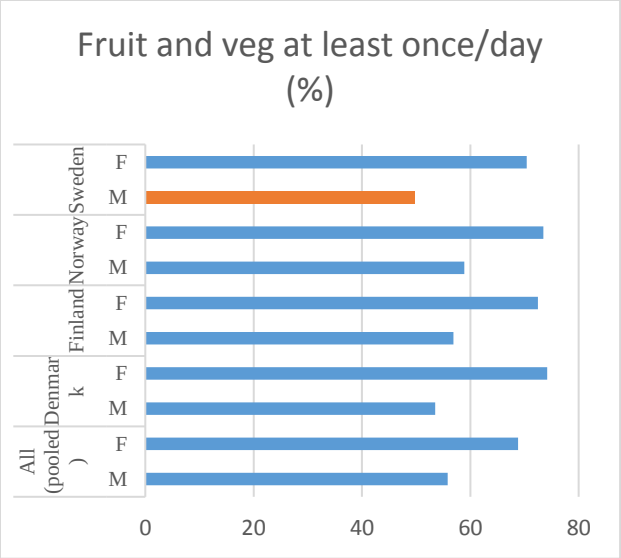

Alcohol > once per week (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 5 10 15 20 25 30 35 40 45

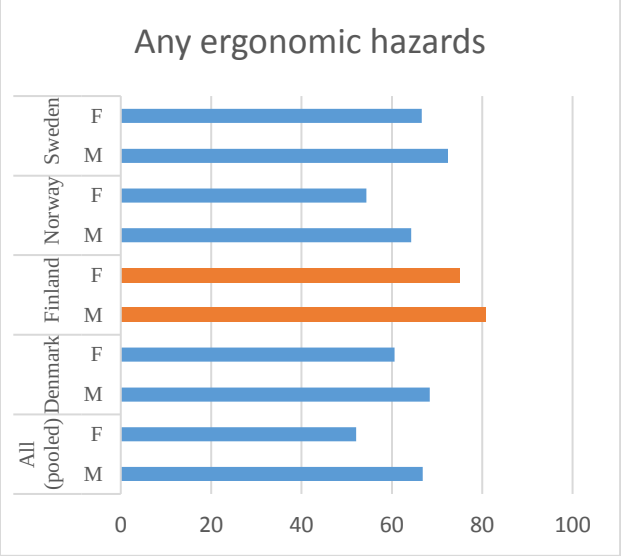

Binge drinking at least weekly (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10

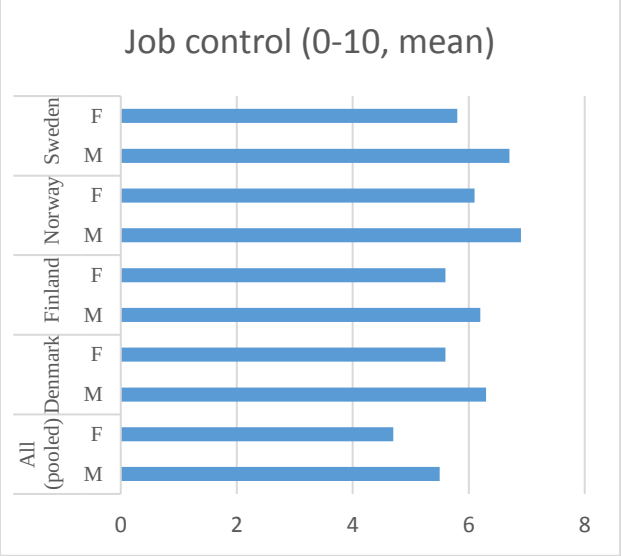

Units on weekend day (mean)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 2 4 6 8 10 12

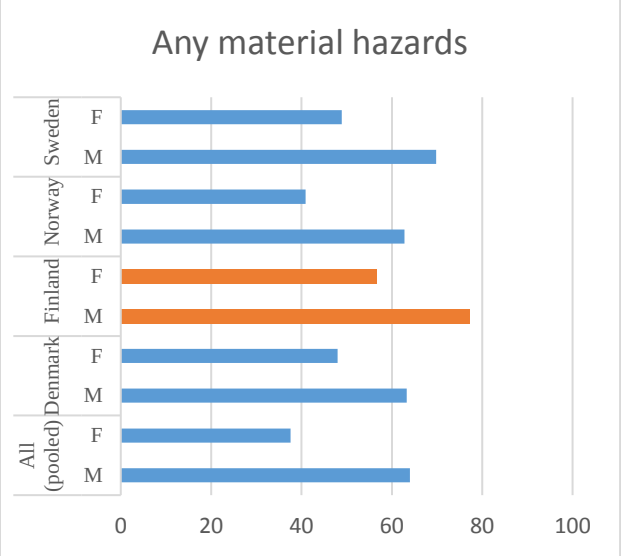

Units on weekday (mean)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0 1 2 3 4 5

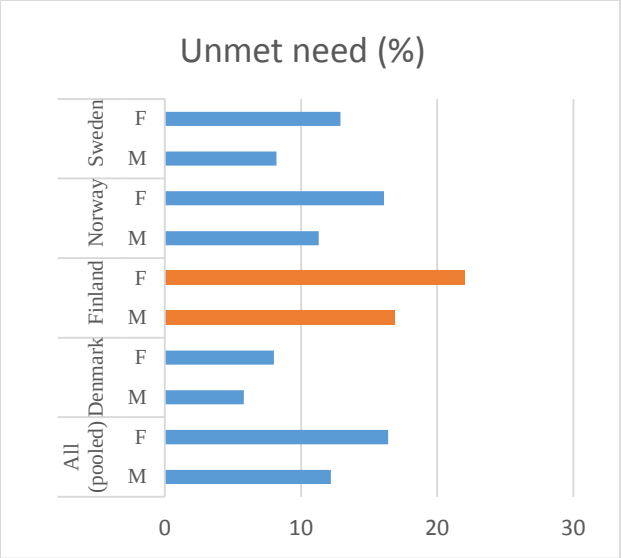

Physical activity on 3-4 days (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
10
20
30
40

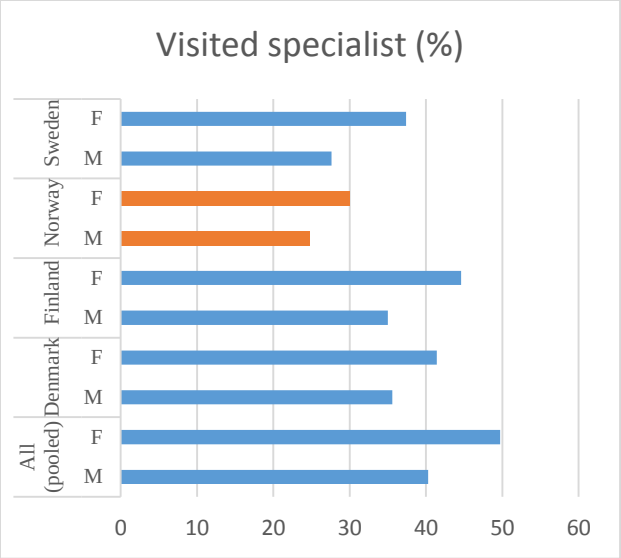

Fruit and veg at least once/day (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
20
40
60
80

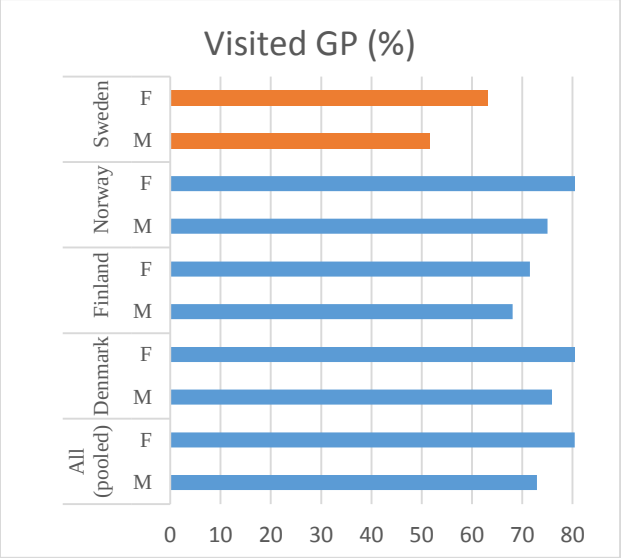

Any ergonomic hazards
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
20
40
60
80
100

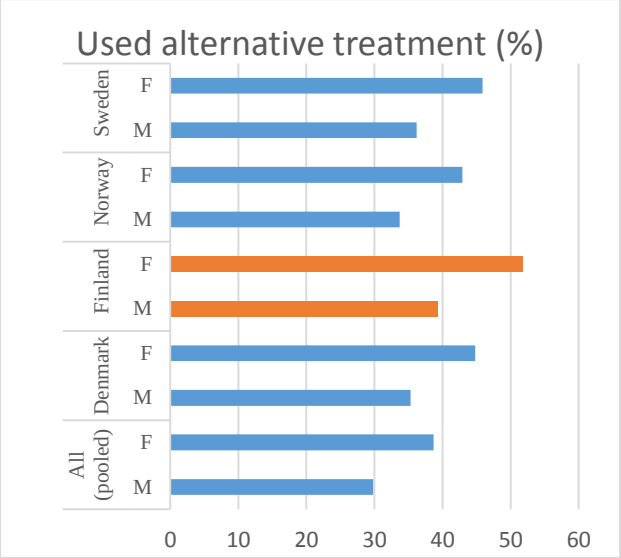

Job control (0-10, mean)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
2
4
6
8

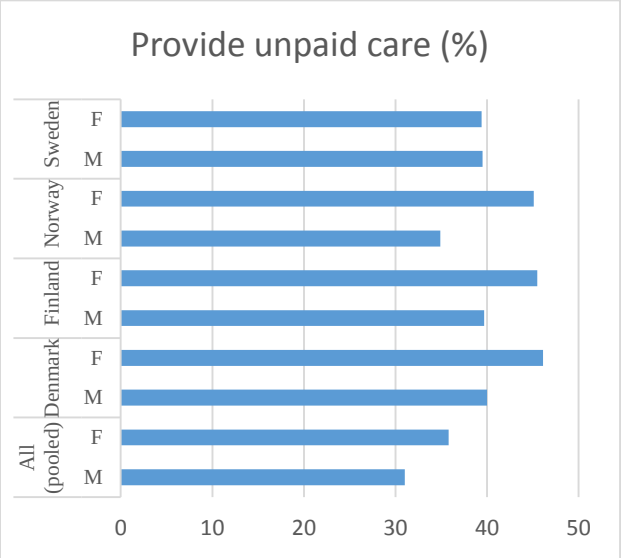

Any material hazards
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
20
40
60
80
100

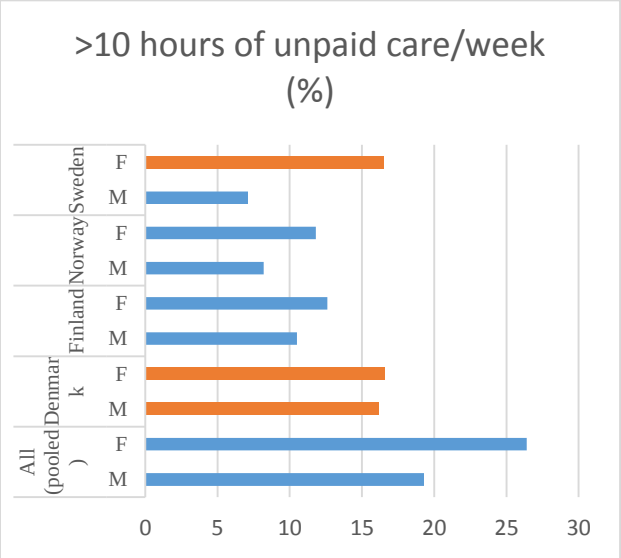

Unmet need (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
10
20
30

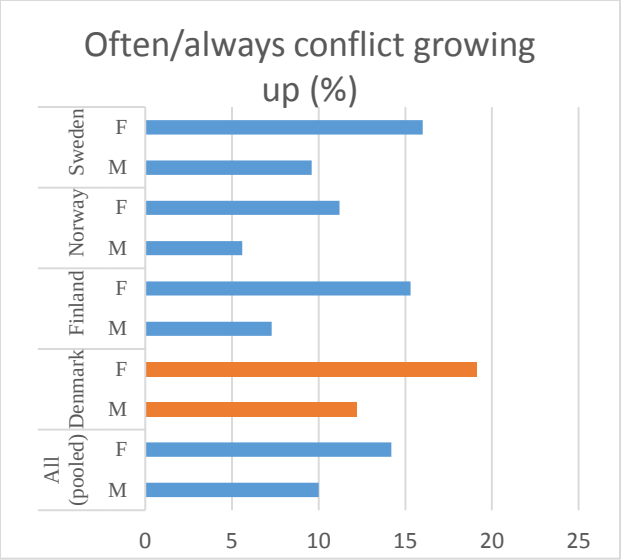

Visited specialist (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
10
20
30
40
50
60

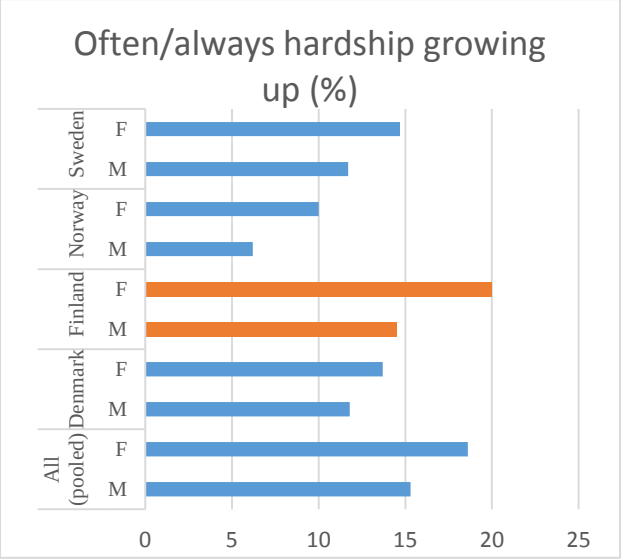

Visited GP (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
10
20
30
40
50
60
70
80


Used alternative treatment (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
10
20
30
40
50
60


Provide unpaid care (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
10
20
30
40
50


>10 hours of unpaid care/week (%)
Sweden
Norway
Finland
Denmark
All (pooled)
F
M
0
5
10
15
20
25
30





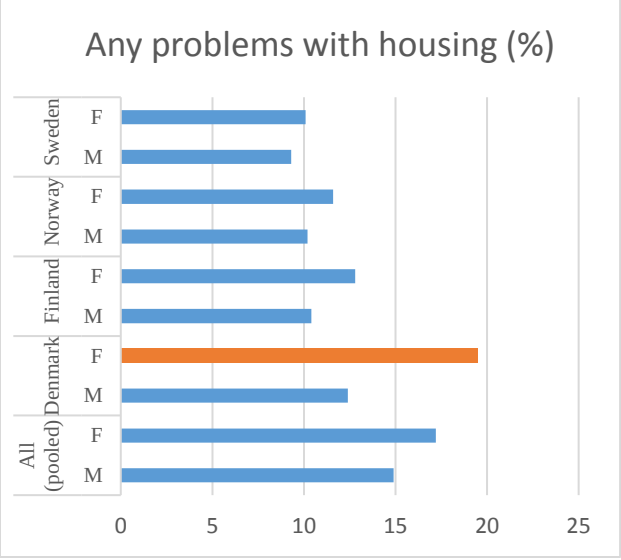


Figure 2. Self-reported behavioural and social determinants for Nordic countries and the European pooled sample (separately for men and women). The X-axis shows the percentage of individuals in each population that report a given behavioural or social determinant. Green bar=lowest prevalence Orange bar=highest prevalence

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